equipment, and the need for the inventors’ improvement in diagnostic techniques and equipment. ’941 Patent at 1:26-3:26; ’499 Patent at 1:20-2:4. The claims then recite specific and novel implementations of apparatus and methods used for diagnosing intermittent arrhythmias that address the limitations in the prior art including the requirement that the users be made aware of the potential arrhythmia and have ready access to specialized diagnostic equipment in a clinical setting.

50. In the Asserted Patents, a unique and novel combination of sensors are used to sense certain parameter values such as, for example, heart rate and activity level, which are then analyzed to predict or determine the presence of an arrhythmia. See, e.g., ’731 Patent at 26:27-52. These novel wearable devices differ from the disclosed and known prior art for several reasons including the incorporation and coordinated use of photoplethysmography (“PPG”), electrocardiography (“ECG”), and movement sensors in order to collect accurate, real-time cardiac data of the user and compare such data to the expected cardiac data based on the activity level of the user. Id. at 4:46-5:29. The collected data also allows device makers to train machine learning algorithms that can more quickly predict and notify users of potential arrhythmias using heart rate data along with information and signals from the other sensors in the watch. Id. at 4:2-10, 5:15-19. The claimed inventions thus offer a uniquely convenient heart monitoring apparatus and methods that leverages wearability, specialized sensors, and machine learning to generate more accessible and effective diagnosis of potentially dangerous arrhythmia conditions.

A. The ’731 Patent

1. Identification and Ownership of the ’731 Patent

51. AliveCor owns by assignment the right, title and interest in United States Patent No. 10,595,731, titled “Methods and systems for arrhythmia tracking and scoring,” which issued
on May 5, 2020, naming David E. Albert, Omar Dawood, Lev Korzinov, Iman Abuzeid, Nupur Srivastava, Fei Wang, Euan Thomson, and Ravi Gopalakrishnan as co-inventors. The ’731 patent issued from U.S. Patent Application Serial No. 16/158,112, filed on October 28, 2018, and expires on December 12, 2034. A copy of the ’731 patent is attached as Exhibit 1. A copy of the assignment from the named inventors to AliveCor is attached as Exhibit 4. A copy of the prosecution history of the ’731 patent is attached as Appendix A.\(^5\) Copies of each patent and applicable pages of each technical reference mentioned in the prosecution history of the ’731 patent are attached as Appendix B.

2. **Foreign Counterparts to the ’731 Patent**

52. Exhibit 7 lists each foreign patent and each pending foreign patent application (not already issued as a patent), and each foreign patent application that has been denied, abandoned or withdrawn, corresponding to the ’731 patent, with an indication of the prosecution status of each such patent application. No other foreign patents or patent applications corresponding to the ’731 patent have been filed, abandoned, withdrawn, or rejected.

3. **Non-Technical Description of the ’731 Patent**

53. The ’731 patent generally relates to the method and device AliveCor invented that enabled a user to wear a smartwatch that would continuously monitor the heart and allow the user to record an ECG. It describes how to take data from an ECG sensor, a PPG sensor, and a motion sensor and run it through machine learning algorithms to determine whether the user may be experiencing an episode of atrial fibrillation and recommending an ECG. Compared to the prior art, the ’731 patent dramatically increased the convenience of such heart monitoring.

\(^5\) A certified copy of the patent prosecution history has been ordered and will be provided once they are received from the U.S.P.T.O.
B. The '941 Patent

1. Identification and Ownership of the '941 Patent

54. AliveCor owns by assignment the right, title and interest in United States Patent No. 10,638,941, titled “Discordance monitoring,” which issued on May 5, 2020, naming David E. Albert, Omar Dawood, Ravi Gopalakrishan, Fei Wang, Euan Thomson, and Iman Abuzeid as co-inventors. The '941 patent issued from U.S. Patent Application Serial No. 16/158,112, filed on October 11, 2018, and expires on May 13, 2036. A copy of the '941 patent is attached as Exhibit 2. A copy of the assignment from the named inventors to AliveCor is attached as Exhibit 5. A copy of the prosecution history of the '941 patent is attached as Appendix C. Copies of each patent and applicable pages of each technical reference mentioned in the prosecution history of the '941 patent are attached as Appendix D.

2. Foreign Counterparts to the '941 Patent

55. Exhibit 7 lists each foreign patent and each pending foreign patent application (not already issued as a patent), and each foreign patent application that has been denied, abandoned or withdrawn, corresponding to the '941 patent, with an indication of the prosecution status of each such patent application. No other foreign patents or patent applications corresponding to the '941 patent have been filed, abandoned, withdrawn, or rejected.

3. Non-Technical Description of the '941 Patent

56. The '941 patent generally relates to the method of refining the accuracy of an potential arrhythmia diagnosis by comparing the data coming in from different sensors with each other. By determining whether each value falls within an expected range as the other values change, the '941 patent explains how discordance can be used to reduce the rate of false positive and false negative errors in a cardiac monitor.
C. The ’499 Patent

1. Identification and Ownership of the ’499 Patent

57. AliveCor owns by assignment the right, title and interest in United States Patent No. 9,572,499, titled “Methods and systems for arrhythmia tracking and scoring,” which issued on February 21 2017, naming David E. Albert, Omar Dawood, Lev Korzinov, Iman Abuzeid, Nupur Srivastava, Fei Wang, Euan Thomson, and Ravi Gopalakrishnan as co-inventors. The ’941 patent issued from U.S. Patent Application Serial No. 14/730,122, filed on June 3, 2015, and expires on December 12, 2034. A copy of the ’499 patent is attached as Exhibit 3. A copy of the assignment from the named inventors to AliveCor is attached as Exhibit 6. A copy of the prosecution history of the ’941 patent is attached as Appendix E. Copies of each patent and applicable pages of each technical reference mentioned in the prosecution history of the ’499 patent are attached as Appendix F.

2. Foreign Counterparts to the ’499 Patent

58. Exhibit 7 lists each foreign patent and each pending foreign patent application (not already issued as a patent), and each foreign patent application that has been denied, abandoned or withdrawn, corresponding to the ’499 patent, with an indication of the prosecution status of each such patent application. No other foreign patents or patent applications corresponding to the ’499 patent have been filed, abandoned, withdrawn, or rejected.

3. Non-Technical Description of the ’499 Patent

59. Like the ’941 patent, the ’499 patent generally relates to the method and devices AliveCor invented that enabled a user to wear sensors that would continuously monitor the heart

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6 A certified copy of the patent prosecution history has been ordered and will be provided once they are received from the U.S.P.T.O.
and allow the user to record an ECG. The ’499 patent envisioned sending the sensor data to a smartphone or a smartwatch in order to determine whether a heart arrhythmia was occurring. Like the ’941 patent, the ’499 patent increased the convenience of heart monitoring for conditions like atrial fibrillation.

D. **Apple’s Infringement Of The Asserted Patents**

1. **Infringement of the ’731 Patent**

60. 71. Apple infringes, literally and/or under the doctrine of equivalents, at least claims 1-15 of the ’731 patent. Apple infringes at least these claims by importing, selling for importation, and/or selling after importation into the United States certain of the Accused Devices, including at least the Apple Watch Series 4, Apple Watch Series 5, and Apple Watch Series 6 (the “Accused ’731 Devices”). The Accused ’731 Devices satisfy all claim limitations of claims 1-15 of the ’731 Patent at the time of importation into the United States.

61. On information and belief, Apple also knowingly induces and/or contributes to the infringement of at least claims 1-15 of the ’731 patent by others. On information and belief, Apple has had knowledge of the ’731 patent, and its infringement of the ’731 patent, since at least December 7, 2020, when AliveCor filed a parallel action in the Western District of Texas.

62. Apple also contributes to infringement of the ’731 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation the Accused ’731 Devices and the non-staple constituent parts of those devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the ’731 patent. These wearable electronic devices with

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7 Complainant’s investigation of Respondent’s infringement is ongoing. Complainant may provide additional theories concerning Respondent’s infringement of the Asserted Patents as Complainant receives discovery.
ECG functionality are known by Apple to be especially made or especially adapted for use in the infringement of the '731 patent. Apple also contributes to the infringement of the '731 patent by selling for importation into the United States, importing into the United States, and/or selling within the United States after importation components, such as the chipsets or software containing the infringing functionality, of the Accused '731 Devices, which are not suitable for substantial non-infringing use and which embody a material part of the invention described in the '731 patent. These mobile devices are known by Apple to be especially made or especially adapted for use in the infringement of the '731 patent. Specifically, on information and belief, Apple sells the Accused '731 Devices to resellers, retailers, and end users with knowledge that the devices are used for infringement.

63. Attached as Exhibit 9 are representative claim charts for the Accused '731 Devices showing infringement of the '731 patent by exemplary Accused '731 Devices.

2. Infringement of the '941 Patent

64. Apple infringes, literally and/or under the doctrine of equivalents, at least claims 12-23 of the '941 patent. Apple infringes at least these claims by importing, selling for importation, and/or selling after importation into the United States certain of the Accused Devices, including at least the Apple Watch Series 4, Apple Watch Series 5, and Apple Watch Series 6 (the “Accused '941 Devices”). The Accused '941 Devices satisfy all claim limitations of claims 12-23 at the time of importation into the United States.

65. On information and belief, Apple also knowingly induces and/or contributes to the infringement of at least claims 12-23 of the '941 patent by others. On information and belief, Apple has had knowledge of the '941 patent, and its infringement of the '941 patent, since at least December 7, 2020, when AliveCor filed a parallel action in the Western District of Texas.